Samsung Electronics

SCX-5312F Digital Laser MFP

February 2003

BACKGROUND INFORMATION

Introduced in March 2002 by Samsung Electronics, which in the past primarily marketed fax machines and desktop laser printers for the retail channel, the SCX-5312F is a desktop digital copier/laser printer/fax/color scanner with optional network printing. Samsung rates the unit at 12 ppm at 600 dpi, enhanced to 1,200 dpi. It is best suited for either personal use or small-workgroup use, such as applications among banks, real-estate firms, medical clinics, etc. It is not designed for heavy-duty copying, and copying features are on the limited side. However, most users will probably find copying, as well as printing, scanning and fax, sufficient for the small workgroup applications for which Samsung intends the unit.

VENDOR PRODUCT-POSITIONING STATEMENT

(**EDITOR'S NOTE:** The information contained in the *Vendor Product Positioning Statement* below was provided by the product vendor *before* the results of the test were released. It is not intended to serve as a response to the results of the *Critical Test Report*.)

"The SCX-5312F multifunctional digital copier provides standard faxing, copying, printing and color scanning. Targeted toward small corporate and vertical market workgroups, small businesses, executive offices, or anywhere space is a premium, it is a cost-effective alternative to purchasing and managing multiple machines. With a relatively small footprint, the SCX-5312F can be placed on a desk to meet the document needs of a busy banker, doctor, or real estate broker.

The SCX-5312F offers exceptional image quality at 1,200 dpi-class resolution for copying and printing, a 12-ppm engine, and a fast first copy out time of approximately 10 seconds. It features 8 MB of printer memory, 4 MB of fax memory, a 33.6 Kbps Super G3 fax modem, and a 550-page paper tray with a 100-sheet bypass. The SCX-5312F incorporates PCL 6 emulation software as standard for high-quality output at a faster speed. For easy connectivity, both parallel and USB interfaces are standard.

The SCX-5312F's cost-saving features include a Toner Save button, which reduces toner consumption by up to 40 percent. A *Power Save* mode lowers energy consumption, and a *Paper Save* mode cuts paper costs by printing two received fax or copied documents onto one page. A built-in duplex printing capability saves paper by printing on both sides. Duplex copying allows two-sided copies from one-sided originals. Incoming faxes can be printed in duplex. Small documents such as receipts, insurance cards and driver's licenses can be copied or scanned with the flatbed platen glass scanner.

Samsung's SmarThru™ 3.0 software helps users manage electronic and paper documents by enabling scanner, copier, scan-to-e-mail, PC-fax and optical character recognition (OCR). SmarThru allows offices to electronically archive legal documents such as proof of insurance and signed contracts.

Industry Analysts, Inc.

CRITICAL TEST REPORT

Digital Multifunctional Device
Electrostatic Imaging

Vendor
Samsung Electronics of America, Inc.
Office Automation
3351 Michaelson Drive
Suite 250
Irvine, CA 92612
http:/www.samsungusa.com

Samsung SCX-5312F Digital Laser MFP
Critical Specs-At-A-Glance

Rec. MPV	Not rated
Print Speed	12 ppm
Max. Paper Size	8.5"x 14"
Max. Print Res.	1,200 dpi (enhanced)
Std. Paper Cap	650 sheets
Max. Paper Cap	650 sheets
Paper Wts.	16-32 lb.
Color Output/ Scanning	No/Yes
Std. RAM	8 MB*
Color Scanning	Yes

*Plus 4 MB of fax memory.

Tested Configuration (List Pricing)

SCX-5312F Digital Laser MFP	$1,999
PortThru Print Server	$175
Total	**$2,174**

Other Available Options
None

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DEVICE OVERVIEW

Engine

Samsung Advertised Print Speed..... 12 ppm
Resolution..... 600 dpi (1,200 dpi enhanced)
Memory..... 8 MB (4 MB for fax)

Paper Capacities

Std Supply.....650 sheets
Sizes .....8.5"x5.5"-8.5"x14"
Paper Weight ..... 16-32 lb.
Paper Trays .....550 sheets
Opt. LCT .....None
Max. Supply. .....650 sheets
Bypass .....100 sheets
Automatic Duplexing..... Limitless

Maximum/Minimum Input Capacities

ADF.....30 originals
Tested ADF Speed ..... 8 originals per minute (opm)
Original Size ..... 6.9"-8.5"wide- 5"-14"long
Scanner Resolution .....600 dpi

Output Capacities

Internal Bin.....250 sheets

Copier Features

Hard Drive.....None
Scan-Once-Print-Many ..... Yes
Electronic Collation ..... Yes

Fax Features

Compatibility ..... Group 3 33.6 Kbps
Transmission Speed .....3 sec.
Memory .....4 MB
Fax Duplexing ..... Yes
Color Fax .....Yes*
*Can scan faxes in color and send them as a color JPEG file.

Printer

Printer RAM ..... 8 MB
Interfaces ..... USB, parallel
Network interface... opt. 10/100BaseTX Ethernet (external)
Supported NOS ..... Win 95, 98, 2000, NT 3x and 4.x, Me, XP; NetWare 3.x, 4.2, 5.0; UNIX,
Print Drivers ..... PCL 6

Software

- *AnyPage Lite* OCR software.
- Using the included TWAIN driver and the "acquire" option from within a software application at their computer workstations, users can scan documents at the device and "pull" them to their software application.
- *SmarThru* 3 software provides scanning capability and resides as an icon on the computer desktop. With it, users at their computer workstations may "pull" – scan – documents loaded in the devices document feeder to their computer desktop. Users may then edit these scanned documents as necessary, e-mail them, process them with the AnyPage Lite OCR software, store the images, print them, etc.
- *SyncThru* Web-based network-printer-management software.

Scanning

Color scan-to-file.....Yes (up to 1,400 dpi)
Scan-to-e-mail ..... Yes
Scan-to-FTP-site.....No
Scan-to-desktop..... Yes
Scan-to-Internet fax ..... Yes
Scan-to-fax..... Yes
QWERTY-style keypad.....No
Authenticated e-mail .....No
LDAP-compatible.....No

Other Noteworthy Features

- Toner-save option is accessed via a key on the control panel, and reduces toner consumption (amount of toner printed on each page) by about 30 percent. When used throughout the life of the cartridge, Samsung states that toner-save mode can extend the toner cartridge's rated yield of 6,000 pages to 7,800 pages by depositing less toner on the page (and so is typically most appropriate for drafts).
- Paper-save mode (print two documents side-by-side on a single sheet of paper) is accessed via a key on the control panel.

Other Configurations

None

Dimensions, Weight and Power

Height..... 18.1"
Width..... 22.0"
Depth ..... 17.0"
Weight.....49.6 lbs.
Power..... 127 VAC, 50/60 Hz, 4A or 240 VAC, 60 Hz, 2.5A
Dedicated Outlet.....Not required

Sold Through

Samsung's authorized office-equipment dealers

IMAGE QUALITY

Image Quality: The quality of the images produced by the Samsung SCX-5312F Digital Laser MFP as evaluated by Industry Analysts, Inc. All images were produced under controlled conditions using automatic or default settings.

	Samsung SCX-5312F Digital Laser MFP			
Copier Optical Density	1.420			
Copy Resolution - (Minimum line pair reproduced per millimeter [lp/mm])	3.5 lp/mm			
Printer Resolution - (Horizontal/vertical point lines produced)	4 pt.			
Copier Halftone Reproduction - (Moiré effect noted in auto mode expressed as line screen/halftone)	150/20, 30 - 133/20, 30			
Minimum Copier Halftone Reproduced - (Before white)	150 line screen/10%			
Maximum Copier Halftone Reproduced - (Before black)	150 line screen/90%			
Printer Halftone Reproduction - (Using an original with halftones ranging from 10% to 100% coverage in 10% gradations)	Halftone gradations were even			
Negative/Positive Line Reproduction - (Discernable differences between line widths when printed in widths ranging from 1 - 6 pts.)	Positive		Negative	
	1, 2, 3 pt.		1, 2, 3 pt.	
Negative/Positive Dot Reproduction - (Percent of correctly printed 1 and 2 pixel positive/negative dots)	1 Pixel		2 Pixel	
	Positive 100%	Negative 0%	Positive 30%	Negative 70%

Image-Quality Discussion

In testing, the Samsung SCX-5312F produced output displaying good printer resolution. As might be expected (since Samsung is relatively newer to copying), copier resolution was not as good as that produced by digital copiers tested by IATSD in the past. Overall, the unit was comparatively good at producing halftones and fine line work.

NETWORK-PRINTER PRODUCTIVITY

IATSD determined printer productivity using its controlled Windows 2000 local area network with a Windows 2000 Professional client. Since printer productivity involves many minor variables (such as network hardware/software throughput efficiency, network-queue polling times, network-server processing power and computer-workstation processing power), the printer-productivity test results below may be difficult to replicate. Productivity tests were performed using a 10-page Microsoft Word text document. Timings were performed using default printer settings, and timing began from the "click of the mouse" until the complete exit of the print.

	Samsung SCX-5312F Digital Laser MFP
Paper Source/Feed/Output	Paper Tray/Short-edge /Finisher
Print Driver	**PCL 6**
Simplex First Page Out Time	18.0 seconds
1 Set Simplex	8.9 ppm
3 Sets Simplex	10.3 ppm
5 Sets Simplex	10.6 ppm
10 Sets Simplex	11.1 ppm
Duplex First Page Out Time (FPOT)	36.2 seconds
1 Set Simplex to Duplex	6.0 ppm
3 Sets Simplex to Duplex	6.6 ppm
5 Sets Simplex to Duplex	6.8 ppm
10 Sets Simplex to Duplex	7.0 ppm

COPIER PRODUCTIVITY

Jobs were timed from the press of the "Start" button until the complete exit of the copy using the document feeder (when applicable) and default automatic settings.

	Samsung SCX-5312F Digital Laser MFP
Paper Source/Feed/Output	Paper Tray/Short-edge/Finisher
Simplex First Copy Out Time	14.7 seconds
1 Set Simplex (ppm)	8.0 ppm
3 Sets Simplex (ppm)	6.5 ppm
5 Sets Simplex (ppm)	8.4 ppm
10 Sets Simplex (ppm)	10.1 ppm
Duplex First Copy Out Time (FPOT)	37.4 seconds
1 Set Simplex to Duplex (ppm)	4.1 ppm
3 Sets Simplex to Duplex (ppm)	5.3 ppm
5 Sets Simplex to Duplex (ppm)	6.0 ppm
10 Sets Simplex to Duplex (ppm)	6.7 ppm

Productivity Discussion

In printer mode, the Samsung SCX-5312F Digital Laser MFP was most productive printing 10 sets in simplex mode, and was somewhat less productive in copier mode, as well as in duplex modes. The unit came closest (11.1 ppm) to its advertised speed (12 ppm) in network-printing mode printing 10 simplex sets. Note that copier FPOT in duplex mode was slower than printer FPOT in duplex mode, as copier FPOT was affected by scanning.

SOFTWARE

Software Component	*Features*
Print Drivers	PCL 6
TWAIN Driver	For "pull-to-desktop" scanning. The user first loads the document to be scanned in the unit's document feeder or on the platen. Next, at their computer workstation, the user selects their software application's "Acquire" function. For instance, in Microsoft Word, the user selects the "Insert Picture" option, and then selects the Samsung TWAIN driver. In the TWAIN driver, users may specify the scanned document's image quality, resolution, size, etc. The user can also preview how the scanned document will appear. To scan the document, the user "clicks on" the scan option in the TWAIN driver. Using our Microsoft Word example, the scanned document is then imported into the Microsoft Word document.
SyncThru	Web-based network-printer management software that enables administrators to configure printer settings; SyncThru also indicates current device status. Entering the printer's IP address in the address field of a standard Web browser accesses SyncThru. SyncThru is compatible with Windows 95, 98 and NT networks. It also provides automatic installation of the PCL 6 print driver.
SmarThru	Provides "pull-to-desktop" scanning, as the user scans the document using *SmarThru's Scan Wizard* utility at their computer workstation (not at the device's control panel). Scanned documents may be sent directly to the *SmarThru* software's image database called *Image Manager*, to the print engine for producing multiple copies; to e-mail addresses, to Web sites, and to the included OCR software.
MFP Driver	Provides printing and scanning capability.
AnyPage Lite	Optical character recognition (OCR) software for converting scanned documents into a file format such as a Microsoft Word document so that they may be edited.

PRINT DRIVER

The SCX-5312F is equipped with a single (PCL 6) print driver.

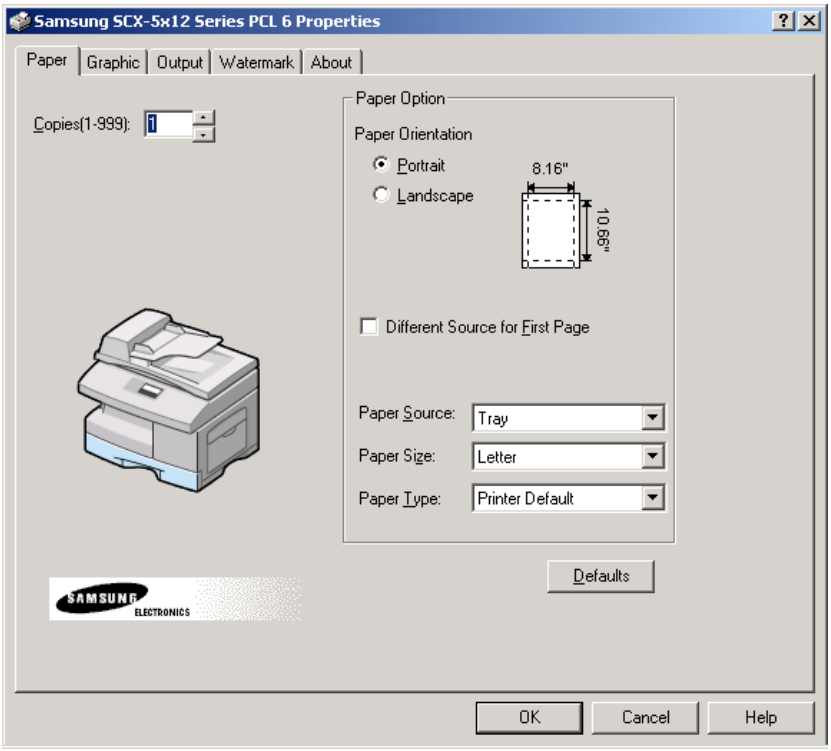

Figure 1 – The SCX-5312F Digital Laser MFP's PCL 6 print driver. This is the main tab, where users may select basic printing options, such as portrait/landscape, different paper for the first page, as well as paper source, size and type.

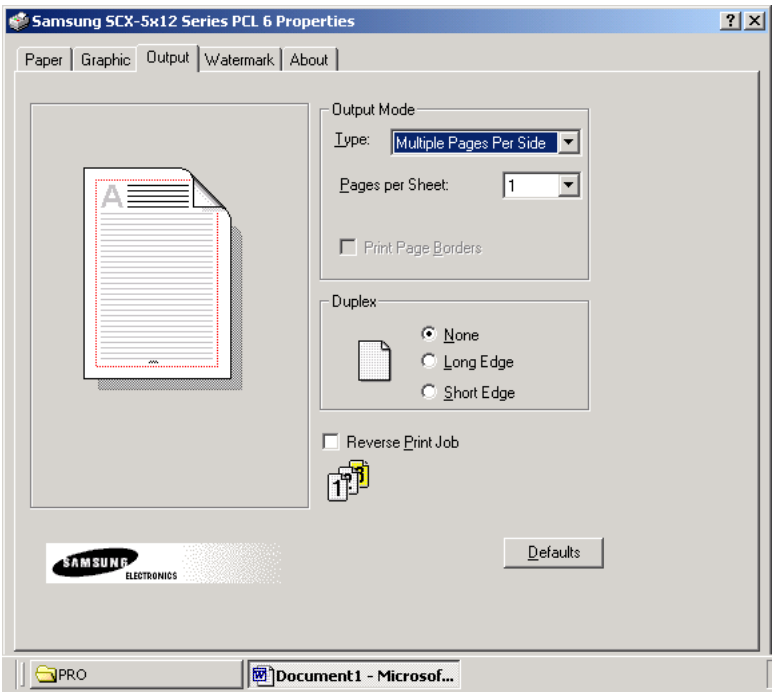

Figure 2 –The SCX-5312F Digital Laser MFP's PCL 6 print driver. With the *Output* tab, users may specify simplex/duplex, N-Up printing (printing multiple pages on a single sheet of paper), etc.

INSTALLATION AND ADMINISTRATION SOFTWARE

The Samsung SCX-5312F's optional PortThru external network printer server provides two tools for administrators to remotely configure, monitor and manage the printer on the network: ***Web SyncThru***, which is accessed by entering the printer's IP address in the address field of a standard Web browser, and ***SyncThru***, which is installed on the computer workstation, and is accessed via the Windows' "Start" menu.

Web SyncThru enables administrators to access the printer's embedded Web server, where they may monitor and configure the printer.

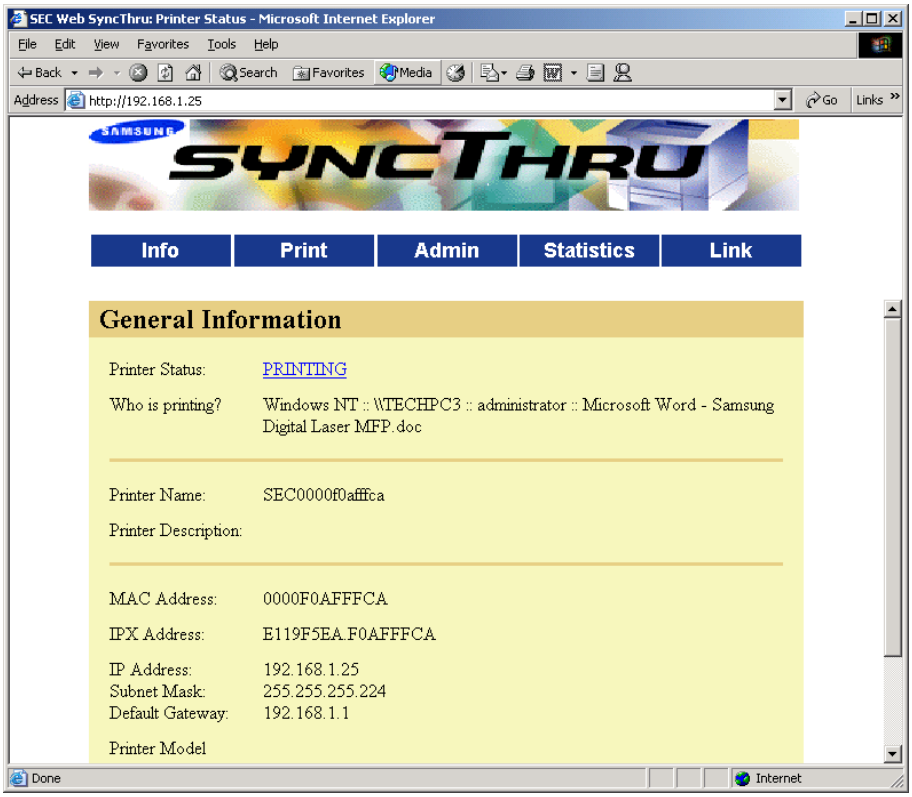

Figure 3 – The SCX-5312F's *Web SyncThru* network-printer management software, which is accessed via a Web browser. Here *Web SyncThru* is indicating: printer status ("printing"), who is printing, and the printer's network settings.

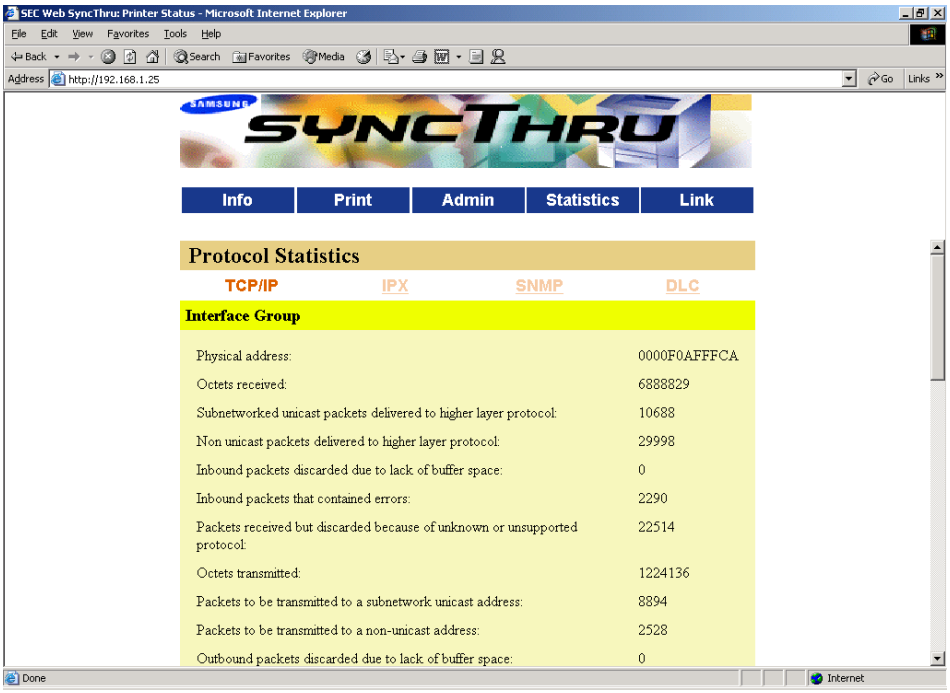
SEC Web SyncThru: Printer Status - Microsoft Internet Explorer
File Edit View Favorites Tools Help
Address http://192.168.1.25
SAMSUNG
SyncThru
Info
Print
Admin
Statistics
Link
Protocol Statistics
TCP/IP
IPX
SNMP
DLC
Interface Group
Physical address: 0000F0AFFFCA
Octets received: 6888829
Subnetworked unicast packets delivered to higher layer protocol: 10688
Non unicast packets delivered to higher layer protocol: 29998
Inbound packets discarded due to lack of buffer space: 0
Inbound packets that contained errors: 2290
Packets received but discarded because of unknown or unsupported protocol: 22514
Octets transmitted: 1224136
Packets to be transmitted to a subnetwork unicast address: 8894
Packets to be transmitted to a non-unicast address: 2528
Outbound packets discarded due to lack of buffer space: 0
Done
Internet

Figure 4 – The SCX-5312F's *Web SyncThru* network-printer management software. A password is required in order to obtain access to the network-configuration settings. Here *Web SyncThru* is indicating network statistics.

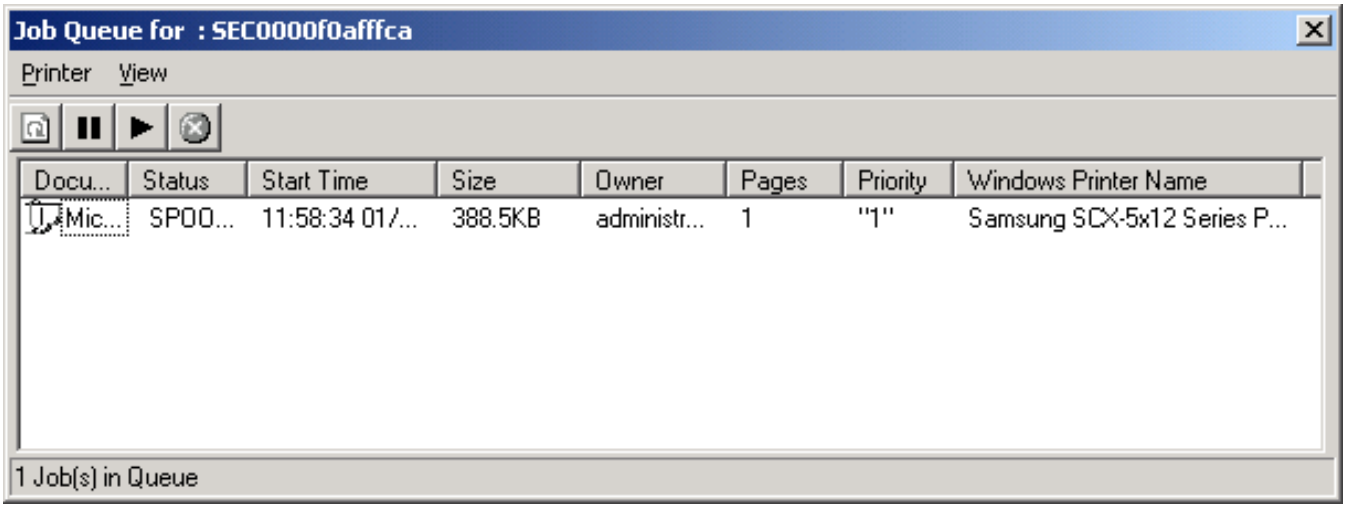
Job Queue for : SEC0000f0afffca
Printer View
Docu... Status Start Time Size Owner Pages Priority Windows Printer Name
Mic... SPOO... 11:58:34 01/... 388.5KB administr... 1 "1" Samsung SCX-5x12 Series P...
1 Job(s) in Queue

Figure 5 – *SyncThru's* job queue, which is accessed via the Windows "Start" menu. Here *SyncThru* is showing the status of a print job (spooling).

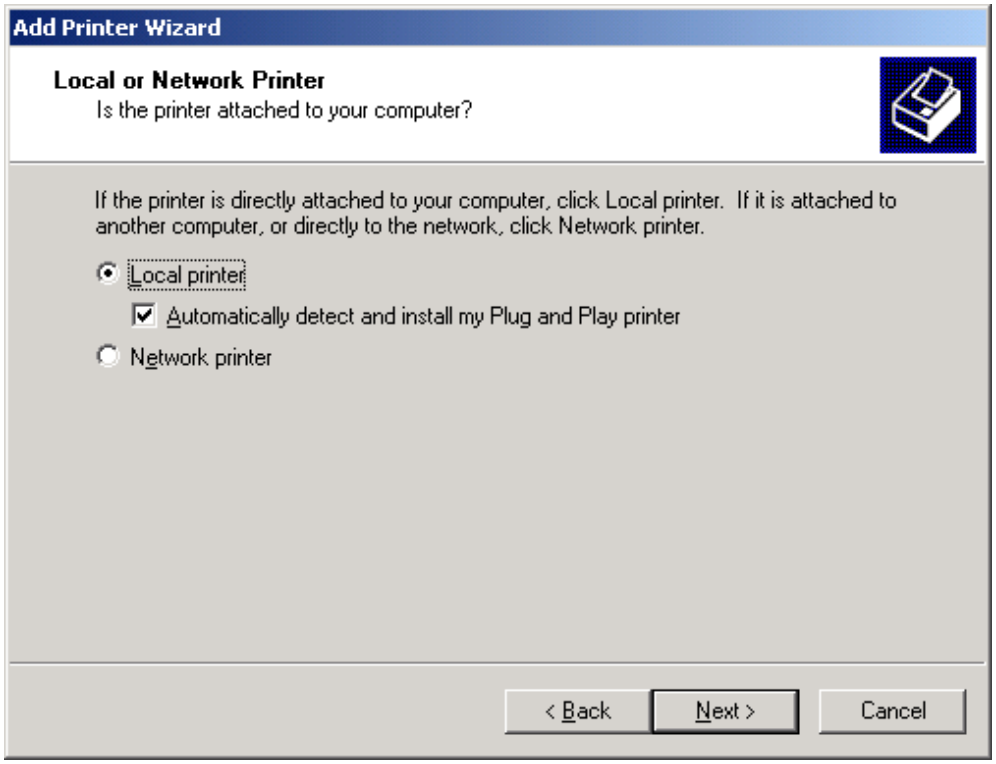
Add Printer Wizard
Local or Network Printer
Is the printer attached to your computer?
If the printer is directly attached to your computer, click Local printer. If it is attached to another computer, or directly to the network, click Network printer.
Local printer
Automatically detect and install my Plug and Play printer
Network printer
< Back
Next >
Cancel

Figure 6 – The user may access Windows' "*Add Printer*" wizard by launching *SyncThru* via the Windows' *Start* menu. The "Add Printer" wizard is a software utility that guides the administrator through the steps of installing the printer.

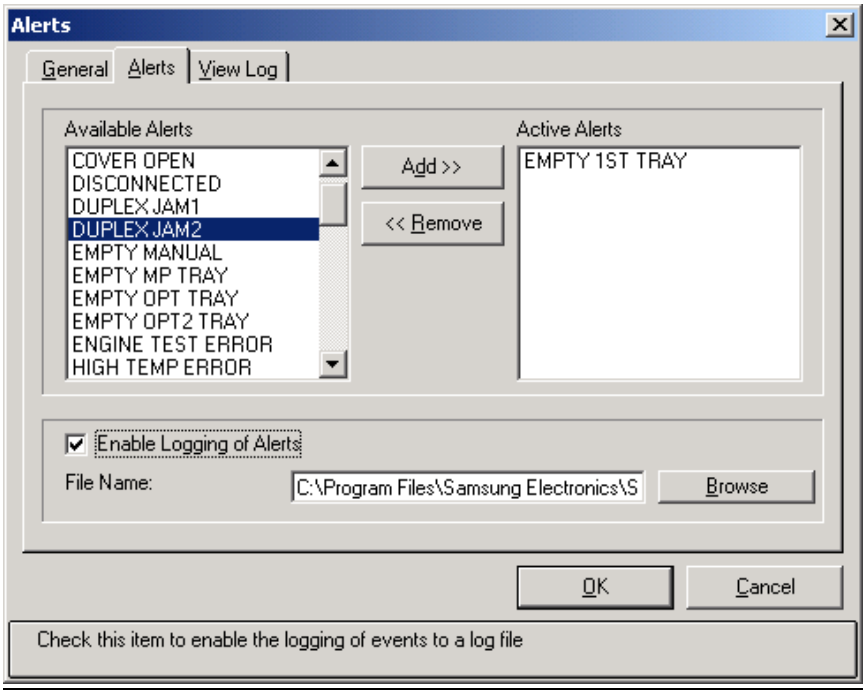

Figure 7 – *SyncThru's* automatic printer-alerts option, which is accessed via the Windows "Start" menu. This option provides automatic "pop-up" alerts notifying the administrator of different printer status conditions. As seen above, the administrator can choose exactly which status conditions for which they wish to receive alerts.

Software Discussion

Samsung's ***SyncThru*** software is geared primarily for administrators, enabling them to configure printer and network settings, and monitor printer status from their desktop. SyncThru is installed on the computer workstation and is accessed via the Windows' "Start" menu.

On the other hand, clients can basically view only device status, such as "ready," and what other users may be printing. Considering that only a few users at most will be sharing the unit, this software should more than adequate.

SCANNING

The Samsung SCX-5312F is equipped with Samsung's *SmarThru* software for "pull-to-desktop" color scanning, as well as a TWAIN driver for "pull-to-desktop" scanning. In order to scan, the unit must be connected directly to a computer workstation via the USB or parallel interface. If the unit is equipped with the optional network interface, it must be connected directly to a computer workstation via the USB interface.

The user scans the document using the *SmarThru* software at their computer workstation (not at the device's control panel). With this scanning system, the user loads the document in the ADF (or places it on the platen). The user "clicks on" the *SmarThru* icon on their computer desktop, launching the *SmartThru* software. At this point, the user then has these options: send the document to the *SmarThru* software's image database called *Image Manager* (see figure 10); scan and send the document to an e-mail address (the user is prompted to enter an e-mail address); scan and send the document to a specified Web site; or scan and send the document to the *AnyPage Lite* OCR software. When sent to the OCR software, it is converted into an "editable" file format such as a Microsoft Word document.

Alternatively, using the included TWAIN driver and the "acquire" option from within a software application at their computer workstations, users can scan documents at the device and "pull" them to their software application. First, the user loads the document in the ADF (or places it on the platen), and then accesses the "Acquire" function in their software application at their computer workstation. For instance, with Microsoft Word, the user selects the "Insert Picture" option, then "From Scanner or Camera," selects the SCX-5312F's TWAIN driver, and then selects "Scan ".

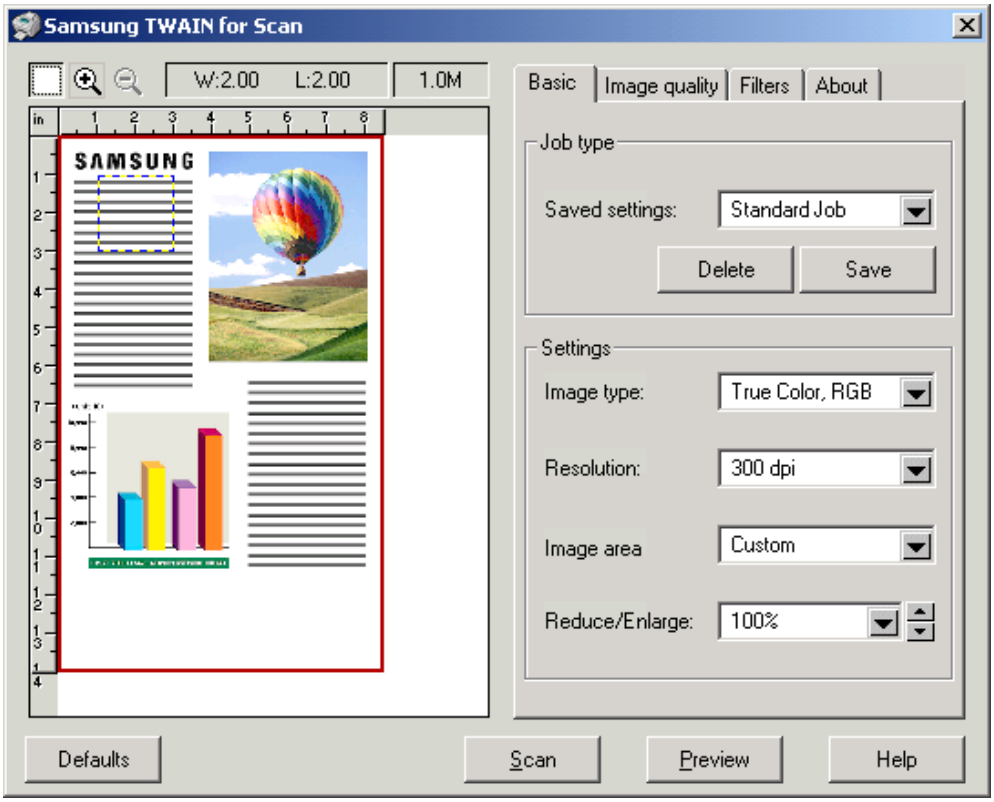

Figure 8 - The SCX-5312F's TWAIN driver (first screen) for scanning.

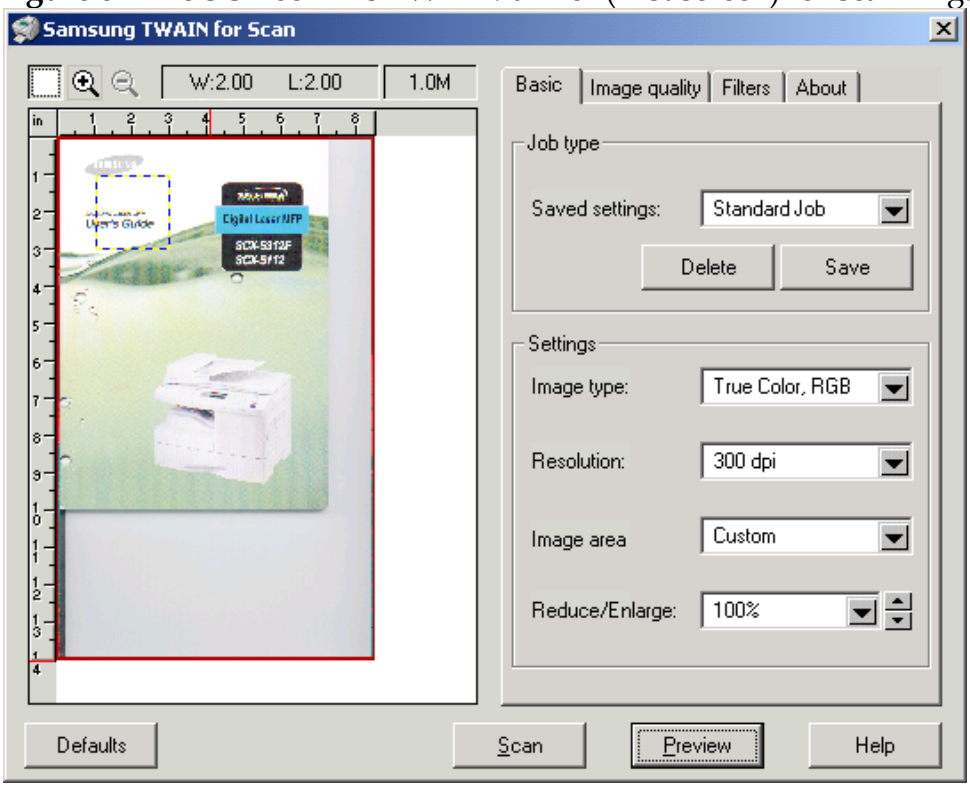

Figure 9 – The SCX-5312F's TWAIN driver, here providing a preview of the document to be scanned.

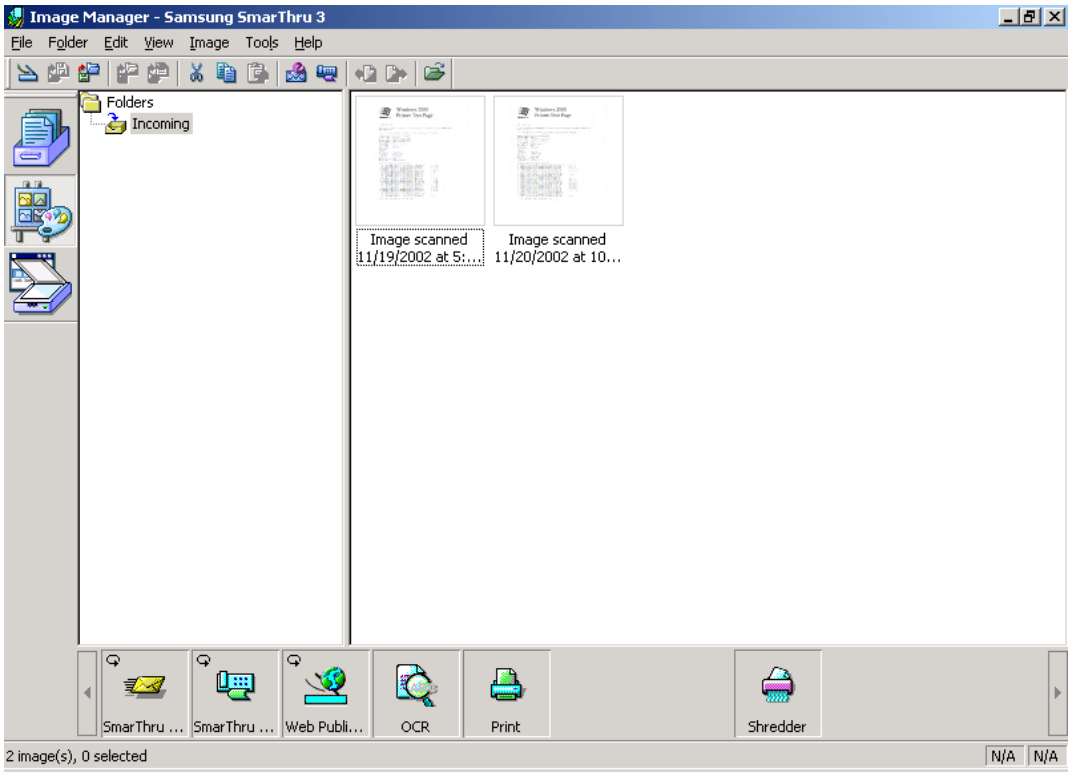

Figure 10 – With *SmarThru's Image Manager* utility, users may print and e-mail scanned documents, as well as store them in network folders, fax them, process them with OCR software, and delete them. *Image Manager* features convenient "drag and drop" operation, so that users simply "drag" the scanned document onto the appropriate icon on the bottom of the tab.

Scanning Discussion

One potential difficulty with the SCX-5312F's pull scanning is that documents to be scanned must be left unattended in the ADF, or on the platen, while the user programs the scanning operation. That means other users may inadvertently remove the documents to be scanned, disrupting the scanning operation. However, this isn't likely to be a problem, since, in order to scan, the unit must be connected directly to a single computer workstation via the parallel or USB interfaces, which means that the computer workstation will be located within just a few feet of the computer workstation. Similarly, even if the customer decides to connect the unit to their LAN with the optional 10/100BaseT Ethernet network interface, the USB interface and direct connection to a computer workstation for scanning is still required, so that contention should not be a problem.

CONTROLS AND MAINTENANCE

Figure 11 – The SCX-5312F's control panel. To the left (not shown) is the numerical keypad for the fax function.

Figure 12 – The SCX-5312F's control panel and main screen. In the lower right corner is a key labeled "Mode/Enter" that enables the user to switch between the fax and copy functions.

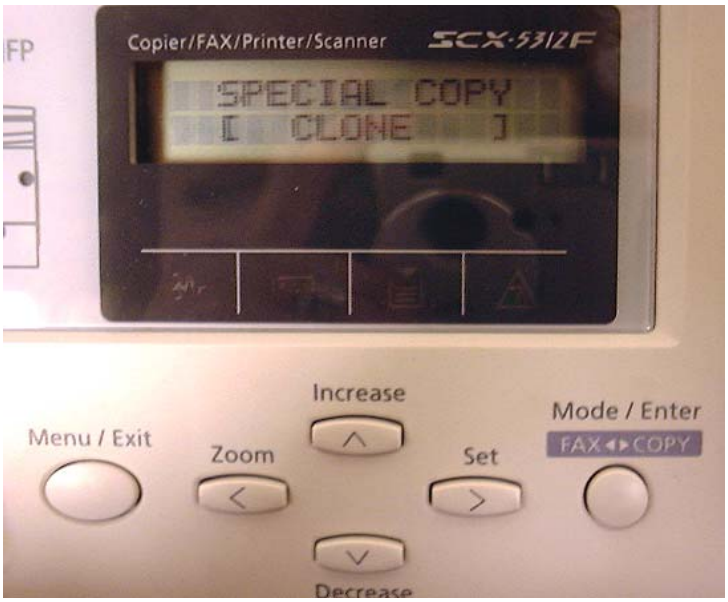

Figure 13 – The SCX-5313F's control panel and LCD panel. Above is the copier "clone" function, which enables users to print multiple images on a single sheet of paper, depending on the size of the paper.

Control-Panel Discussion

In general, the SCX-5312F's control panel is very basic, as the number of copier features are fairly limited, as might be expected in a low-volume copier. Copier features consist of: setting the number of copies (from 1-999), adjusting contrast, adjusting zoom (from 25-400% in 1% increments), selecting an image mode (text, mixed, photo, high quality) and duplex (on or off).

The unit's control panel uses menus and cursor/hard enter keys as opposed to a more convenient touch screen. However, most units in this segment typically do not have touch screens.

Because there are relatively few copier features (compared, for instance, to digital copier/printers marketed by the digital copier companies), the control panel is easy to use, even for casual users.

Figure 14 – The SCX-5313F's 550-sheet paper drawer.

Adding Paper: Adding paper to the unit's paper drawer is easy. There are no corner separators to contend with, so that adding an entire ream of paper in a single step is simplified. The paper drawer is equipped with out-stops, so that users cannot inadvertently pull the entire drawer out of the unit.

Changing Paper Sizes: Changing paper sizes is fairly easy. The user must adjust two paper guides (see the figure above). To adjust the smaller size guide, the user simply squeezes it, which releases it so that it may be adjusted. The larger guide (shown on the left in the photograph directly above) must be removed, which is somewhat inconvenient. The control panel does not automatically indicate the new paper size; instead, the user must indicate the new size using the control-panel keys.

Figure 15 – The SCX-5313F's 100-sheet bypass paper tray.

Figure 16 –The SCX-5312F's toner cartridge. On the right is a side-access area (the side-access area does not need to be opened in order to replace toner).

Adding Toner: Adding toner is easy. The user first opens the front cover, and then pushes down a lever to release the old toner cartridge. The user then pulls out the old toner cartridge. After gently shaking the new toner cartridge in order to make sure the toner is evenly distributed, the user slides the new cartridge into place (so that it is locked), and then closes the front cover.

Figures 17-20 – The SCX-5312F's areas where misfeeds may be removed (clockwise): front cover, fuser area, bypass tray, and paper drawer.

Removing Misfeeds: If a misfeed occurs, a message appears on the touch screen indicating where the misfeed occurred:

- The message "PAPER JAM 0" means the misfeed occurred in the paper drawer or paper bypass tray. The user should open the drawer and remove any misfed paper.
- If there is no misfed paper, they should proceed to opening the bypass tray to remove any paper that may be misfed there.
- The message "PAPER JAM 1" means the misfeed occurred in the fuser area. To access the fuser area, the user opens the unit's side cover.
- The message "PAPER JAM 2" means the misfeed occurred in the paper-exit area. To access this area, the user opens the front cover.

Maintenance Discussion

The Samsung SCX-5312F is a relatively easy MFP to use and maintain. IATSD had no difficulty adding toner or paper, and, while very basic, the control panel is very easy to operate.

IATSD "BOTTOM LINE"

Competitive Advantages

- Inexpensive ($1,999 list price) SOHO MFP that packs in nearly all office-imaging applications –laser printing, scanning, copying, color scanning, Group 3 walkup fax, and optional network printing.
- Small footprint (18.1" x 22.0" x 17.0") and relatively lightweight (49.6 lbs.) for easy deployment nearly anywhere.
- Standard Group 3 33.6 Kbps walkup fax.
- Standard automatic duplexing.
- Standard ***AnyPage Lite*** OCR and color scanning.
- Optional ***SyncThru*** and ***Web SyncThru*** network-printer management software when equipped with optional network interface.

Competitive Disadvantages

- Toner cost per page is 1.9 cents (based on Samsung's stated page yield for toner and on an original with 4 percent page coverage). This is higher than that of many other imaging devices, such as digital copier/printers.
- With pull scanning, the scanning operation is performed at the computer workstation, not at the device. This means documents must be left in the ADF (or on the platen) unattended; another user may inadvertently remove the documents to be scanned, causing disruption. However, because the unit will be typically be used by only one user, this is unlikely to occur.
- The unit employs short-edge paper scanning and printing, which is a disadvantage, since short-edge feeding is 23 percent slower than long-edge feeding, and, second, most copiers users are more familiar with long-edge paper feeding.

Suitable For:

- Personal use by one user for scanning, printing, fax and copying; other users can use it for fax and copying.
- SOHO, small workgroup printing if equipped with optional network interface.

Not Suitable For:

- Mid- or large-volume copying, printing or scanning.

Conclusion

Because it provides so many office-imaging functions, the Samsung SCX-5312F may not necessarily be competitive for use primarily as a casual walk-up copier. Additionally, at four-percent area coverage, toner cost per page is 1.9 cents, which is higher than most digital copiers' cost per page.

However, this relatively high cost per page is offset by its real strength, which is that it combines the primary office-imaging functions (color scanning, fax, printing and copying) at an extremely aggressive price point ($1,999). Most customers will probably wish to deploy the unit in one of the following ways:

- If connected directly to a computer workstation via either the standard USB or parallel interface, one person at the computer workstation can use it for scanning, printing, copying and walkup fax. Other users can use it for copying and walkup fax.
- If installed on a local area network with the optional network interface, several users can use it for printing, copying and walkup fax. One person (whose computer workstation is connected directly to the unit via USB interface) will also be able to use it for scanning.

All in all, the Samsung SCX-5312F is an easy-to-install, cost-effective, versatile office-imaging unit that will be suitable for deployment in many environments, including SOHO offices, executive offices, and satellite offices and branches.

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